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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,410	12/12/2003	John Yasaitis	2550/186	2106
2101	7590	01/31/2005		
BROMBERG & SUNSTEIN LLP 125 SUMMER STREET BOSTON, MA 02110-1618				
			EXAMINER KALIVODA, CHRISTOPHER M	
			ART UNIT 2883	PAPER NUMBER

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/735,410	Applicant(s) YASAITIS, JOHN	
	Examiner Christopher M. Kalivoda	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to because in Figure 1, reference sign 17 shows what appears to be a stack. However, part of the stack is washed. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al., U.S. Patent Application Publication 2004/0042729.

Regarding independent claims 1 and 5, Zhou et al. teach a coupler/method for coupling light in an optical system (para 0110, lines 1-4 and Fig 4I, ref sign 104) comprising:

a plurality of discrete layers of alternating optical materials having respective first and second indexes of refraction (para 0104, lines 1-2, para 0107, lines 4-6 and especially lines 8-10) for coupling light of a given wavelength (para 0011, lines 7-11), the thickness of each layer being a fraction of the light wavelength (para 0106, lines 1-7).

While the reference does not specifically state "respective first and second indexes of refraction", first and second indexes of refraction are implied since the layers have "alternating indexes of refraction" as referenced above and since the alternating layer materials are provided in pairs also referenced above.

In addition, while the reference does not specifically state "coupling light of a given wavelength" a given wavelength is implied since Zhou et al. teach that a wavelength of 1.5 microns is popular also referenced above.

Lastly, while the reference does not specifically state "the thickness of each layer being a fraction of the light wavelength", the thickness of each layer is clearly a fraction of the light wavelength since the composite film thickness runs between 10-15 microns (para 0106, last line) and there can be 100 or more layers (para 0107, lines 8-10). This

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means (at least on average) each film thickness (assuming 100 layers) is between 0.1 and 0.15 microns and is obtained by dividing the composite film thickness by 100. The film thickness (0.1 – 0.15 microns) is thus a fraction of the light wavelength of 1.5 microns referenced above.

Regarding claims 2 and 6, the fraction is 1/10 for similar reasoning given in the preceding paragraph. Assuming a larger composite film thickness (15 microns) and 100 layers then (at least on average) the film thickness is 0.15 microns and is 1/10 of the wavelength 1.5 microns given above.

Regarding claims 3, 4, 7 and 8, Zhou et al. disclose the limitations of claims 1 and 5 as described above. In addition, Zhou et al. teach the use of silicon as one of the two materials in the alternating layers optical materials. However, the reference is silent with respect to the specific materials pairs such as silicon and silicon nitride or silicon and silicon rich nitride.

It is well known in the art to select known materials based on suitability for its intended use (see MPEP 2144.04; Sinclair & Carroll Co v Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945)).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to select use silicon and silicon nitride or silicon and silicon rich nitride to couple to devices using these materials.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,810,190 to Manolatu describes a coupling device with a discrete layer of optical materials. However, the materials are not alternating with first and second index of refractions. Japanese Publication 06-160291 to Satoru et al. describes a coupling device with alternating layers of materials of high and low refractive index and the layer thickness varies in relation to the center of the coupler.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

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Should you have questions on access to the Private PAIR system, contact the
Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Brian Healy
Primary Examiner